

Express Mail Label No. EL996743086US

PATENT APPLICATION

Docket No.: 11675.165.1



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE  
BEFORE THE BOARD OF PATENT APPEALS AND  
INTERFERENCES

In re application of

Zhiping Yin  
Mark E. Jost

Serial No.: 09/293,188

Filed: April 16, 1999

For: INTERCONNECT STRUCTURE WITH  
INTERLAYER DIELECTRIC

Confirmation No.: 4546

Examiner: Phat X. Cao

Art Unit  
2814

TRANSMITTAL OF APPEAL BRIEF UNDER 37 C.F.R. § 1.192

Mail Stop Appeal Brief - Patents  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

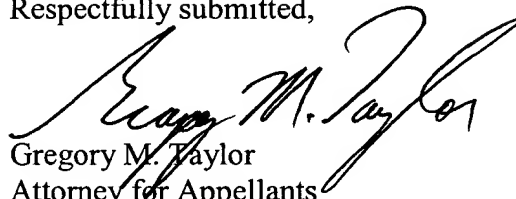
Transmitted herewith in triplicate is a Brief of Appellants for entry in the above-identified application. Appellants have filed a timely Notice of Appeal from the action of the Examiner dated March 26, 2003. Also enclosed are the following:

- ☒ A Certificate of Express Mail Under 37 C.F.R. § 1.10
- ☒ Credit Card Payment Form PTO-2038 authorizing payment of \$330.00 for the filing fee.

x The Commissioner is hereby authorized to charge payment of any patent application processing fees under 37 CFR 1.17 associated with this communication or credit any overpayment to Deposit Account No. 23-3178. Duplicate copies of this sheet are attached.

Dated this 27<sup>th</sup> day of October 2003.

Respectfully submitted,



Gregory M. Taylor  
Attorney for Appellants  
Registration No. 34,263  
Customer No. 022901

Docket No.: 11675.165.1

In re application of

Serial No.: 09/293,188

Filed: April 16, 1999

For: INTERCONNECT STRUCTURE WITH  
INTERLAYER DIELECTRIC

Confirmation No.: 4546


Examiner: Phat X. Cao

Art Unit  
2814

I hereby certify that the following documents are being deposited with the United States Postal Service "Express Mail Post Office to Addressee" service under 37 C.F.R. § 1.10 in an envelope addressed to: Mail Stop Appeal Brief – Patents, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on the 27<sup>th</sup> day of October 2003.

- Brief of Appellant
- Credit Card Payment Form PTO-2038 for \$330.00
- Transmittal Letter
- Postcard

Respectfully submitted,

  
Gregory M. Taylor  
Attorney for Appellants  
Registration No. 34,263  
Customer No. 022901

Express Mail Label No. EL996743086US

PATENT APPLICATION  
Docket No.: 11675.165.1



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE  
BEFORE THE BOARD OF PATENT APPEALS AND  
INTERFERENCES

In re application of	)	
	)	
Zhiping Yin	)	
Mark E. Jost	)	
	)	
Serial No.:	)	
09/293,188	)	
	)	
Filed:	)	Art Unit
April 16, 1999	)	2814
	)	
For:	)	
INTERCONNECT STRUCTURE WITH	)	
INTERLAYER DIELECTRIC	)	
	)	
Confirmation No.:	)	
4546	)	
	)	
Examiner:	)	
Phat X. Cao	)	

BRIEF OF APPELLANT

Mail Stop Appeal Brief - Patents  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

Appellants, Zhiping Yin and Mark E. Jost, have filed a timely Notice of Appeal from the action of the Examiner in finally rejecting all of the claims in this application. This brief is being filed under the provisions of 37 C.F.R. § 1.192. The filing fee of \$330.00, as set forth in 37 C.F.R. § 1.17(c) is submitted herewith.

10/29/2003 EFLORES 00000100 09293100

01 10:1402

330.00 DP

### REAL PARTY IN INTEREST

The real party in interest is Micron Technology, Inc., by way of assignment from Zhiping Yin and Mark E. Jost, who are the named inventors and are captioned in the present brief. The assignment documents were recorded at Reel No. 010264, Frame 0180 in the United States Patent and Trademark Office on June 18, 1999.

### RELATED APPEALS AND INTERFERENCES

There are no related appeals or interferences.

### STATUS OF CLAIMS

Claims 1, 2, 7-10, 15-20, 29, and 30 are pending and appealed in the present application. Claims 3-6, 11-14, and 21-28 have been cancelled.

### STATUS OF AMENDMENTS

All amendments have been previously entered.

### SUMMARY OF INVENTION

The present invention is directed to a semiconductor structure comprising an electrically conductive interconnect 12 disposed within a first dielectric layer 14, with the interconnect having an upper surface and comprising a metal. A passivation layer 32 is upon the upper surface, with the passivation layer comprising the chemical structure  $M-N-H_x$ , where M represents the metal of the interconnect. An interlayer dielectric 18 is upon the first dielectric layer and upon the upper surface of the interconnect, with the interlayer dielectric being

continuously adhered to the upper surface (Fig. 4). The passivation layer substantially covers the upper surface of the interconnect in order to chemically protect about 1-1,000 atomic lattice layers thereof (spec., page 10, lines 4-9).

### ISSUES

1. Whether Claims 1-2, 7-10, 15-20 and 29-30 are unobvious over U.S. Patent No. 5,780,908 to Sekiguchi et al. (hereafter "*Sekiguchi*") in view of U.S. Patent No. 6,077,774 to Hong et al. (hereafter "*Hong*").

2. Whether claims 1-2, 7-10, 15-20, and 29-30 are unobvious over *Sekiguchi* in view of U.S. Patent No. 6,114,238 to Liao (hereafter "*Liao*").

### GROUPING OF CLAIMS

Claims 1-2, 9-10, 15-16, and 29-30 stand or fall together. Claims 7-8 and 17-20 stand or fall together.

### ARGUMENT

1. Claims 1-2, 7-10, 15-20 and 29-30 are Unobvious Over *Sekiguchi* in view of *Hong*

Claims 1-2, 7-10, 15-20, and 29-30 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over *Sekiguchi* in view of *Hong*. For the reasons that follow, Appellant respectfully submits that claims 1-2, 7-10, 15-20, and 29-30 are unobvious over *Sekiguchi* in view of *Hong*.

The law is well settled that to "establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation ... to modify the

reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations.” Furthermore, the “teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant’s disclosure.” (citations omitted) M.P.E.P. §§ 2142, 2143, p. 2100-121, -122, 8<sup>th</sup> ed. (Aug. 2001).

Claim 1 recites that the passivation layer comprises “the chemical structure  $M-N-H_x$ , where M represents the metal of the interconnect” and that “the passivation layer substantially covers the upper surface of the interconnect in order to chemically protect about 1-1,000 atomic lattice layers thereof.” Independent claims 7, 8, 9, 15, 16, 17, 19, 29, and 30 recite similar features of the passivation layer(s) chemically protecting about 1-1,000 atomic lattice layers of the interconnect. There is no teaching or suggestion in *Sekiguchi* or *Hong* of such recited features for a passivation layer(s).

In addition, independent claims 7, 17, and 19 recite that a second passivation layer comprises “multiple layers of nitrogen compounds adsorbed upon said first passivation layer according to Brunauer’s Type V adsorption.” Independent claim 8 recites that a passivation layer comprises “nitrogen adsorbed upon said upper surface according to Brunauer’s Type V adsorption.” There is no teaching or suggestion in *Sekiguchi* or *Hong* of such recited features for a passivation layer, and no teaching of what if any type of adsorption is present.

Accordingly, claims 1-2, 7-10, 15-20, and 29-30 would not have been obvious over *Sekiguchi* in view of *Hong*. Appellant therefore respectfully requests that the rejection of claims 1-2, 7-10, 15-20, and 29-30 under 35 U.S.C. § 103(a) be overturned.

2. Claims 1-2, 7-10, 15-20 and 29-30 are Unobvious Over *Sekiguchi* in view of *Liao*

Claims 1-2, 7-10, 15-20, and 29-30 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over *Sekiguchi* in view of *Liao*. For the reasons that follow, Appellant respectfully submits that claims 1-2, 7-10, 15-20, and 29-30 are unobvious over *Sekiguchi* in view of *Liao*.

As discussed above, claim 1 recites that the passivation layer comprises “the chemical structure M-N-H<sub>x</sub>, where M represents the metal of the interconnect” and that “the passivation layer substantially covers the upper surface of the interconnect in order to chemically protect about 1-1,000 atomic lattice layers thereof.” Independent claims 7, 8, 9, 15, 16, 17, 19, 29, and 30 recite similar features of the passivation layer(s) chemically protecting about 1-1,000 atomic lattice layers of the interconnect. There is no teaching or suggestion in *Sekiguchi* or *Liao* of such recited features for a passivation layer(s).

In addition, as also discussed previously, independent claims 7, 17, and 19 recite that a second passivation layer comprises “multiple layers of nitrogen compounds adsorbed upon said first passivation layer according to Brunauer's Type V adsorption.” Independent claim 8 recites that a passivation layer comprises “nitrogen adsorbed upon said upper surface according to Brunauer's Type V adsorption.” There is no teaching or suggestion in *Sekiguchi* or *Liao* of such recited features for a passivation layer, and no teaching of what if any type of adsorption is present.

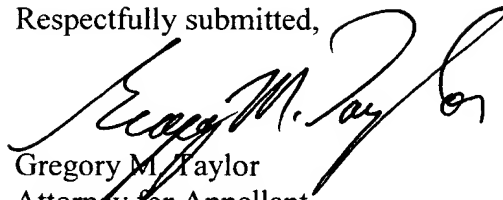
Accordingly, claims 1-2, 7-10, 15-20, and 29-30 would not have been obvious over *Sekiguchi* in view of *Liao*. Appellant therefore respectfully requests that the rejection of claims 1-2, 7-10, 15-20, and 29-30 under 35 U.S.C. § 103(a) be overturned.



In view of the foregoing, Appellants respectfully request the Board to overturn the Examiner's rejections of the appealed claims.

Dated this 27<sup>th</sup> day of October 2003.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Gregory M. Taylor", is written over the typed name.

Gregory M. Taylor  
Attorney for Appellant  
Registration No. 34,263  
Customer No. 022901

GMT:vfw  
WA11675\165.1\VFVW0000002578V001.doc